

AMENDMENTS TO THE CLAIMS

1. (Original) An oxygen sensor analyzer for use in testing the performance of an oxygen sensor comprising a portion of a vehicle emission system having an on-board computer, said oxygen sensor analyzer comprising:

a housing having a keypad, said keypad having a plurality of keys and indicator lights disposed thereon; and

a plurality of modes of operation, comprising:

a closed loop oxygen sensor monitor mode, for showing, in real time, the dynamic operation of the oxygen sensor being tested;

a simulated oxygen sensor mode, for simulating oxygen sensor signals o the vehicle computer, while monitoring the oxygen sensor for its reaction to the simulation; and

a oxygen sensor test mode, for performing an oxygen sensor test which forces the engine to run lean without the need for injecting propane thereinto.

2. (Canceled)

3. (Canceled)

4. (Original) An oxygen sensor analyzer for use in testing the performance of an oxygen sensor comprising a portion of a vehicle emission system having an on-board computer, the oxygen sensor analyzer comprising:

(a) an electronic circuit having an oxygen sensor input for receiving an oxygen sensor signal from the oxygen sensor with the oxygen sensor disconnected from the on-board computer, a simulate output for connection to the on-board computer in place of the oxygen sensor, and logic means operative for driving the simulate output in:

(i) a closed-loop mode wherein the simulate output directly follows the oxygen sensor input; and

(ii) a simulate mode wherein the simulate output, being isolated from the oxygen sensor input, is driven in an arbitrary manner for forcing the engine to run one or both of lean by driving the simulate output to simulate a rich indication from the oxygen

sensor, and rich by driving the simulate output to simulate a lean indication from the oxygen sensor; and

a display for indicating the oxygen sensor signal.

5. (Original) The oxygen sensor analyzer of claim 4, wherein the logic means is further operative for:

(a) driving the simulate output in a test mode wherein the simulate output, being isolated from the oxygen sensor input, is driven in a predetermined manner that includes forcing the engine to run lean by driving the simulate output to simulate a rich indication from the oxygen sensor; and

(b) monitoring the oxygen sensor input to measure time-response thereof between conditions of the engine running lean and running rich.

6. (Original) The oxygen sensor analyzer of claim 5, wherein the logic means is further operative for signaling a ready condition in the test mode wherein the oxygen sensor input is indicative of the engine having reached a stable lean operating condition, and subsequently enabling the measure of time response when the oxygen sensor input is indicative of engine operation passing from lean toward rich.

7. (Original) The oxygen sensor analyzer of claim 6, wherein the oxygen sensor input is responsive over a voltage range including a first predetermined value representing a lean operating condition of the engine, the signaling of the ready condition being inhibited until the sensor input maintains for a predetermined period of time a voltage representing a more lean operating condition than that represented by the first predetermined value.

8. (Original) The oxygen sensor analyzer of claim 7, wherein the voltage range is from approximately 0 V representing a most lean operating condition of the engine to approximately 1 V representing a most rich operating condition of the engine, the first predetermined value being approximately 175 mV.

9. (Original) The oxygen sensor analyzer of claim 5, wherein the electronic circuit comprises a timer for measuring a passing interval within which the oxygen sensor input

changes from a first predetermined value representing a lean operating condition of the engine to a second predetermined value representing a rich operating condition of the engine, the electronic circuit being operative to signal a passing condition only if the oxygen sensor input reaches the second predetermined value within a predetermined period of time.

10. (Original) The oxygen sensor analyzer of claim 4, wherein the display comprises a plurality of indicators, each of the indicators being activated by the electronic circuit continuously in response to the oxygen sensor input in accordance with a predetermined range of the oxygen sensor signal.

11. (Original) The oxygen sensor analyzer of claim 10, wherein the oxygen sensor input is responsive over a voltage range of approximately 1 volt and at least one of the indicators is activated when the oxygen sensor input is within the voltage range.

12. (Original) A portable oxygen sensor analyzer for use in testing the performance of an oxygen sensor comprising a portion of a vehicle emission system having an on-board computer, the oxygen sensor analyzer comprising:

(a) an electronic circuit having an oxygen sensor input for receiving an oxygen sensor signal from the oxygen sensor, with the oxygen sensor disconnected from the on-board computer, over a voltage range of from approximately 0 V representing a most lean operating condition of the engine to approximately 1 V representing a most rich operating condition of the engine, a simulate output for connection to the on-board computer in place of the oxygen sensor, and logic means operative for driving the simulate output in:

(i) a closed-loop mode wherein the simulate output directly follows the oxygen sensor input;

(ii) a simulate mode wherein the simulate output, being isolated from the oxygen sensor input, is driven in an arbitrary manner for forcing the engine to run one or both of lean by driving the simulate output to simulate a rich indication from the oxygen sensor, and rich by driving the simulate output to simulate a lean indication from the oxygen sensor;

(iii) a test mode wherein the simulate output, being isolated from the oxygen sensor input, is driven in a predetermined manner that includes forcing the engine to

run lean by driving the simulate output to simulate a rich indication from the oxygen sensor, the logic means being further operative for signaling a ready condition after the engine reaches a stable lean operating condition as signaled by the oxygen sensor input remaining for a predetermined period of time below a first predetermined value representing a lean operating condition of the engine, and subsequently monitoring the oxygen sensor input to measure time-response thereof between conditions of the engine running lean as signaled by the oxygen sensor input passing the first predetermined value and running rich as signaled by the oxygen sensor reaching a second predetermined value being higher than the first predetermined value; and

(b) a display for continuously indicating the oxygen sensor signal.

13. (Original) The oxygen sensor analyzer of claim 12, wherein the first predetermined value is approximately 175 mV and the second predetermined value is approximately 800 mV.

14-18. (Canceled)